

Claims

1. A blocking device (30) for blocking a rotary motion of a shaft (14) relative to
5 a housing (16) of a gear-drive unit (10), having a first blocking element (32) and a
second blocking element (34) which latter is displaceable relative to the first
blocking element (32) by means of at least one electromagnet (44) and at least
one restoring element (42), characterized in that the blocking elements (32, 34) in
10 the blocked state mesh in the axial direction with one another by form-locking, and
the blocking device (30) is embodied as a separate, independent structural unit
(31), which can be mounted as a unit (31) onto the housing (16) on the one hand
and onto the shaft (14) on the other.

2. The blocking device (30) as defined by claim 1, characterized in that the two
15 blocking elements (32, 34) each have radially extending indentations (82) and
radially extending raised areas (84), which can mesh with one another in form-
locking fashion in order to block the rotary motion of the shaft (14).

3. The blocking device (30) as defined by one of claims 1 or 2, characterized
20 in that the two blocking elements (32, 34) and the electromagnet (44) are located
in an approximately closed barrier housing (52), which is insertable into the
housing (16) of the gear-drive unit (10).

4. The blocking device (30) as defined by one of the foregoing claims,
25 characterized in that the first blocking element (32) is embodied as a rotatable disk
with radial moldings (68) - such as an inner toothing (68) - which are capable of
engaging corresponding counterpart moldings (70) - such as an outer toothing
(70) - of a slaving means (66) located on the shaft (14) in a manner fixed against
relative rotation, which slaving means is thrust into the blocking element (32) after

the blocking element is installed.

5. The blocking device (30) as defined by one of the foregoing claims, characterized in that the electromagnet (44) is not supplied with current in the blocked state, and the second blocking element (34) is pressed in form-locking fashion into the first blocking element (32) by the at least one restoring element (42), and in the rotating state the electromagnet (44) is supplied with current, in order to detach the second blocking element (34) axially from the first blocking element (32).
6. The blocking device (30) as defined by one of the foregoing claims, characterized in that the barrier housing (52) forms at least one axial stop (74) for the first blocking element (32) - in particular in the form of a stop disk (60).
7. The blocking device (30) as defined by one of the foregoing claims, characterized in that the first, rotatable blocking element (32) has axial extensions (62, 61, 63), which are braced on the at least one axial stop (60, 74) of the barrier housing (52).
8. The blocking device (30) as defined by one of the foregoing claims, characterized in that the various axial extensions (62, 61, 63) are braced on both sides of the stop disk (60) in such a way that an axial engagement of the two blocking elements (32, 34) with one another in rotary operation is prevented.
9. The blocking device (30) as defined by one of the foregoing claims, characterized in that the extensions (62, 61, 63) form a detent hook (61) or a dome with a clamping or securing ring, or are radially deformed after being pushed through the stop disk (60).

10. The blocking device (30) as defined by one of the foregoing claims, characterized in that as an electrical contacting means (56), spring elements (89) which extend in the axial direction are located on one face end (88) of the electromagnet (44).

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11. The blocking device (30) as defined by one of the foregoing claims, characterized in that the electromagnet (44) is located in a coil holder (46), on which for axial guidance and/or prevention of relative rotation of the second blocking element (34), axial guide elements (78) - in particular pegs (78) - are integrally formed on, which engage corresponding counterpart elements (80) of the second blocking element (34).

12. The blocking device (30) as defined by one of the foregoing claims, characterized in that at least one of the two blocking elements (32, 34) - in particular the second blocking element (34) - is made at least in part of plastic, such as an elastomer.

13. A gear-drive unit (10), having a blocking device (30) as defined by one of the foregoing claims, characterized in that a roller bearing (18) with an outer ring (90) and an inner ring (92) is located on the blocking device (30), and the outer ring (90) is braced on the housing (16), and the inner ring (92) receives the shaft (14) - in particular with a slaving means (66) located on it in a manner fixed against relative rotation.

14. The gear-drive unit (10) as defined by one of the foregoing claims, characterized in that the roller bearing (18), as part of the blocking device (30), is integrated solidly with the barrier housing (52).

15. The gear-drive unit (10) as defined by one of the foregoing claims,

characterized in that the first, rotatable blocking element (32) is braced axially on the inner ring (92) of the roller bearing (18).

16. The gear-drive unit (10) as defined by one of the foregoing claims,
5 characterized in that the first, rotatable blocking element (30) is braced axially on the shaft (14) - in particular on a collar (94) of the slaving means (66).

17. The gear-drive unit (10) as defined by one of the foregoing claims,
10 characterized in that the first, rotatable blocking element (32) is braced axially elastically on the inner ring (92) and/or on the shaft (14) - for instance by means of an axial spring (96) - in order to compensate for longitudinal play of the shaft (14) that is supported axially loosely in the roller bearing (18).

18. A method for producing a gear-drive unit (10) as defined by one of the
15 foregoing claims, characterized in that the blocking device (30) is first secured in the housing (16) of the gear-drive unit (10), and next the shaft (14) - in particular with the slaving means (66) - is introduced with a form lock that has play into a central recess (64) in the first blocking element (32) - and in particular with a close clearance fit into the roller bearing (18).

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19. The method as defined by claim 18, characterized in that the blocking device (30) with the barrier housing (52) is built into the housing (16) of the gear-drive unit (10) in a manner fixed against relative rotation and in particular is axially secured by means of material deformation.

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20. The method as defined by claim 18 or 19, characterized in that the shaft (14) is positioned by means of a fixed bearing (18, 20) in the housing (16) in such a way that the first, rotatable blocking element (32) is pressed - in particular by means of the axial spring (96) - with a predeterminable prestressing force axially

against the inner ring (92) of the roller bearing (18).

21. The method as defined by claims 18 through 20, characterized in that
before being built into the housing (16) and before the installation of the shaft (14)
5 as a separate unit (31), enclosed by the barrier housing (52), the blocking device
(30) is easily monitorable as to its function, in particular its power consumption.